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Aurora lights way to Lab future

The plan is set, the teams have been selected and now it's time to move forward and strategically plan the future. Aurora, LLNL's Vision for 2025, is officially under way.

"This is an opportunity to make some exciting decisions," said Director Michael Anastasio. "This process allows us to think out into the future and decide what our Laboratory might look like. The world will be a very different place in 2025. Given that, what do we need to do to bring the future to the present?"

In the Laboratory tradition of naming special projects, this strategic planning process has been titled "Aurora" — after the Roman goddess who symbolizes the dawn of a new day. In this case, Aurora will be the Lab's way to provide long-term clarity and strategic direction.

The official project kickoff was held Tuesday with a gathering of managers and employees who will participate in Aurora. Five Strategic Vision 2025 planning teams will begin meeting next week to identify initiatives that will shape the Laboratory in the future. The focus areas of the teams, representing a broad cross-section of



Laboratory employees, include: Missions and Sponsors; Science and Technology; Operations and Infrastructure; Workforce and Work Environment; and Partnerships and Relationships.

All employees are encouraged to help shape the Lab's future by providing input directly to the teams. A new Website located on MyLLNL portal (<https://www-r.llnl.gov/>) allows employees to submit ideas to any or all of the teams.

"The creative ideas, insights and salient questions submitted by employees are vital to the success of Aurora," said Cherry Murray, deputy director of Science and Technology. "We recognize that there are many sources of good ideas and we want all employees to be able to contribute, whether or not they are on a planning team."

Planning teams also are expected to hold town hall/ brown bag lunch meetings in May to gather additional input from employees.

The project is on an aggressive schedule that calls for the teams to report out on

See **AURORA**, page 7

Oldest objects in universe provide valuable clues to age of the solar nebula

By Anne M. Stark

NEWSLINE STAFF WRITER

The oxygen and magnesium content of some of the oldest objects in the universe are giving clues to the lifetime of the solar nebula, the mass of dust and gas that eventually led to the formation of our solar system.

By looking at the content of chondrules and calcium aluminum-rich inclusions (CAIs), both components of the primitive meteorite Allende, Laboratory physicist Ian Hutcheon, with colleagues from the University of Hawaii at Manoa, the Tokyo Institute of Technology and the Smithsonian Institution, found that the age difference between the two fragments points directly to the lifetime of the solar nebula.

CAIs were formed in an oxygen-rich environment and date to 4.567 billion years ago, while chondrules were formed in an oxygen setting much like that on Earth and date to 4.565 billion, or less, years old.

"Over this span of about 2 million years, the oxygen in the solar nebula changed substantially in its isotopic makeup," Hutcheon said. "This is telling us that oxygen was evolving fairly rapidly."

The research appears in the April 21 edition of the journal *Nature*.

One of the signatures of CAIs is an enrich-

See **NEBULA**, page 8

Energy Secretary Bodman calls for DOE contractors to plug into electrical safety

By Don Johnston

NEWSLINE STAFF WRITER

Following several serious electrical incidents in DOE facilities, Energy Secretary Samuel Bodman has called for a renewed effort to improve electrical safety programs across the complex.

Citing an electrical safety report covering the year since DOE launched its Electrical Safety Campaign in April 2004, Bodman said in a memorandum last week that "electrical safety incidents during routine activities are a significant concern. In the past year we have experienced the electrocution of a lineman, severe arc flash burns to a technician and numerous near-miss occurrences."

See **ELECTRICAL**, page 7

New approach to the study of microbes

By David Gilbert

NEWSLINE STAFF WRITER

Thriving in every conceivable environmental niche, the vast majority of microbes are resistant to being grown under standard laboratory conditions. This makes it difficult to study the little critters and how their specialized metabolic properties can either maintain the delicate environmental balance or wreak havoc.

Enter the sleuthing sci-

See **MICROBES**, page 8



CRAIG SMITH/UNIVERSITY OF HAWAII

DNA from whale bone was taken as part of the new study.



Getting to the heart of the matter

— Page 5



Earth Expo returns with fanfare

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DOE awards UC contract for Berkeley lab

— Page 8



LAB COMMUNITY NEWS

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Saturday
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The "Science on Saturday" lecture series visits Merced County today when LLNL and UC Davis biomedical engineer Frank Chuang discusses "Biodefense: Detection to Protect the Nation" at Buhach Colony High School Theater in Atwater. Lectures are free and will begin at 9:30 a.m. and end at 11:30 a.m. Seating is on a first come, first served basis. The talks are intended for junior high, high school and college students. The topics are selected from the forefront of science and technology research in a variety of disciplines. For a complete list of lectures, topics, and directions to each lecture location, go to the Web at <http://www.mccd.edu/mcti/sos/2005/default 2005.htm>.

Wednesday
27

Zack Norwood of the Lasers Engineering Division will talk about a trip through Central America made in a bus adapted to run on used cooking oil at 1 p.m. today in the Bldg. 361 auditorium. The bus was converted and is owned by **Sustainable Solutions Caravans**, a non-profit organization devoted to renewable energy, organic farming, and sustainable lifestyles. This talk is part of the Lab's Earth Week activities and is sponsored by the Pollution Prevention Team in the Environmental Protection Department's Permits and Regulatory Affairs Group. For more information, contact Michael Meltzer, 4-6923.

...

Fidelity is offering an **Estate Planning** Workshop today from 9 -11 a.m. in the Bldg. 361 auditorium. In this workshop you will learn: What estate planning is and the dangers of not planning; current federal estate and gift tax law and how it may impact you, four common estate planning tools; common transfer strategies; how beneficiary designations on your workplace retirement account affect your estate; important information about naming your trust as your beneficiary on your retirement account; and how federal income tax is calculated on withdrawals from workplace retirement accounts. Space is limited. Register for this workshop by calling 1-800-642-7131 and specify that you are a UC/LLNL employee. For more information, contact the Benefits Office, 2-9957.

Up & Coming

The next deadline for **academic plans** is May 2. The Employment and Organization Development Department is continuing to process requests for funding of degree programs on a quarterly basis. Review and approvals are done quarterly, rather than monthly, by the Student Policy Committee. FY05 deadlines for submission of Graduate and Undergraduate Academic Plans are as follows: Feb. 1, May 2, Aug. 1, and Nov. 1. All requests should be sent to the Education Office, L-728. Requesters will be notified following the Student Policy Committee meeting scheduled for the first Thursday of the following month. For additional information, contact the Education Office, 4-5479.

IN MEMORIAM

CFO Directorate and colleagues mourn loss of Wayne Nelson

Wayne Nelson, a work for others specialist, in the Sponsor Funding & Directorate Support Division of the Chief Financial Officer Directorate, died in an auto accident on Thursday, April 14. He was 40.

Nelson, a resident of Tracy, was responsible for providing user leadership to many of CFO's work for others (WFO) systems projects, as well as supporting the Engineering Directorate as their WFO Specialist. During his work in Property Accounting and for the last eight years in Work for Others, he interacted with many people here at the Laboratory.

Nelson was originally from Hawkinsville, Georgia; he has been with LLNL since 1988 after he graduated from Fort



Wayne Nelson

Valley State University. Nelson was the twelfth of thirteen children in his family. He was an active member of the Lab's Association of Black Laboratory Employees (ABLE) and the Tracy African American Association.

Nelson was known for his jovial smile and his great sense of humor. He loved kidding around with his co-workers. He will be sorely missed by his customers and his colleagues, especially by his CFO Directorate family.

Memorial services are scheduled for Saturday, April 23 in Georgia. A local memorial service is planned for the week of April 25, in Livermore. For information, call 3-6764.

Delmar "Del" A. Statler

Services have been held for retiree Delmar "Del" A. Statler, who died in Santa Rosa April 12 at the age of 71.

Born Sept. 5, 1933, in Denver, he moved to California after a term in the Navy. While stationed at Mare Island in Vallejo, he met and married his wife, Ellen. In 1958 they moved to Livermore, when Statler began working in the Laboratory's Electrical Engineering Department. He retired in 1993.

A few years before his retirement, Statler and his wife moved to Bethel Island and enjoyed boating

and fishing on the Delta. They were married for 33 years before Ellen passed away. Several years later Del met his second love, Susan, and moved to Willits. They loved to travel several months out of the year in their motor home going from coast to coast.

Survivors include his children and stepchildren, Pam and Bill Heinz, LaDonna Simmons, Pam and Ricky Jacobson, and Cindy Campbell, as well as 10 grandchildren and step-grandchildren, and two great grandchildren.

Clarence S. Frates

Clarence S. Frates died April 10 at Beverly Manor Convalescent Hospital in Stockton. He was 79.

Born Dec. 9, 1925, in Danville, Calif., he lived in Tracy for 35 years. He served in the Army during the Korean War and earned a Purple Heart.

Frates retired from the Lab, where he worked as a custodian at Site 300 for 20 years. He enjoyed camping and fishing, especially at the Tracy Wildlife Club.

Frates is survived by his daughter, Mary McCready and her husband David of Placerville; four brothers; three sisters; grandson Brian; granddaughter Jennifer; and many nieces and nephews.

Frates was preceded in death by his wife of 45 years, Mary Jane, who died in 2000; and one

brother, George.

Private services were held. Donations may be made to Alzheimer's Aid Society of Northern California, P.O. Box 1824, Sacramento 95812.

Newsline

Newsline is published weekly by the Public Affairs Office, Lawrence Livermore National Laboratory (LLNL), for Laboratory employees and retirees.

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NEWS OF NOTE



DDLS looks to 'horizons of biomedical imaging'

Dr. Roderic I. Pettigrew will deliver a Director's Distinguished Lecturer Series presentation, "Horizons in Biomedical Imaging and Bioengineering," at 3:30 p.m. Wednesday, April 27 in the Bldg. 123 auditorium. Pettigrew is director of National Institute of Biomedical Imaging and Bioengineering, National Institutes of Health.

Pettigrew will discuss how rapid, revolutionary changes in the world of biomedical research are moving the field of "personalized medicine" from concept to reality. Although still in its infancy, the use of custom-tailored tools, technologies, and therapies to diagnose and treat diseases before symptom onset is increasing. The National Institute of Biomedical Imaging and Bioengineering (NIBIB) plays a crucial role in furthering the



Roderic I. Pettigrew

tools and technologies needed for personalized medicine.

Pettigrew became director of NIBIB in September 2002 after being a professor of Radiology, Medicine (Cardiology), and Bioengineering at the Emory University School of Medicine and director of the Emory Center for Magnetic Resonance Research. He has a B.S. in physics from Morehouse College, an M.S. in nuclear medicine and engineering from Rensselaer Polytechnic Institute, a Ph.D. in applied radiation physics from MIT (where he was a Whitaker Harvard-MIT Health Science Scholar), and an M.D. from the University of Miami School of Medicine.

He completed his internship and residency in internal medicine at Emory University and completed a residency in nuclear medicine at

the University of California, San Diego. Pettigrew spent a year as a clinical research scientist with Picker International, the first manufacturer of MRI equipment. In 1985, he joined Emory as a Robert Wood Johnson Foundation Fellow with an interest in non-invasive cardiac imaging.

Pettigrew is the recipient of numerous awards, including the Bennie (Benjamin E. Mays) Award for Achievement in 1989, when he also delivered the keynote Eugene P. Pendergrass New Horizons Lecture at the 75th-anniversary scientific meeting of the Radiological Society of North America.

The presentation will be rebroadcast on Lab TV channel 2 Thursday, May 5 at 10 a.m., noon, 2, 4, and 8 p.m. and Friday, May 6, at 4 a.m.

For more information, see the DDLS website: <http://lsto.llnl.gov/DDLS/>.

For information related to the DDLS presentation, check the National Institute of Biomedical Imaging and Bioengineering Website: <http://www.nibib1.nih.gov/>.

Talk to examine used vegetable oil as alternative to high-priced gas

Zack Norwood of the Lasers Engineering Division will talk about a trip through Central America made in a bus adapted to run on used cooking oil at 1 p.m. Wednesday, April 27 in the Bldg. 361 auditorium.

The vintage 1970s bus recently made a trip to Costa Rica, rolling through the United States, Mexico, and points beyond consuming 700 gallons of fuel that restaurants often have to pay to get hauled away. Used cooking oil is a fuel that can be found for free in many parts of the world. The bus is owned by Sustainable Solutions Caravans, a non-profit organization devoted to renewable energy, organic farming, and sustainable



This 1970s school bus has been converted to run on used cooking oil.

lifestyles.

In a slideshow, Norwood will describe the journeys and how Sustainable Solutions converted a diesel engine to biofuel, including information on the heating elements and filtration needed and the technical difficulties encountered.

This talk is part of the Laboratory's Earth Week and is sponsored by the Environmental Protection Department's Pollution Prevention Team in the Permits and Regulatory Affairs Group. For more information on the Pollution Prevention Team, go to its website at <http://www-p2.llnl.gov/>.

Science on Saturday lecture series goes to the central valley

The Lab's popular "Science on Saturday" (SOS) lecture series is on the road, traveling in Merced County in April and May to offer the following presentations.

- April 23, "Biodefense: Detection to Protect the Nation," by Frank Chuang, biomedical engineer, UC Davis and LLNL, at Buhach Colony High School Theater, Atwater.

- May 14, "From the Big Bang to California: Observation of the Universe," by Wil van Breugel, research astronomer, LLNL Institute of

Geophysics and Planetary Physics, at Los Banos High School, Los Banos.

"We bring SOS to promote interest in science and technology among students in the Central Valley. SOS offers students an opportunity to experience the excitement of Laboratory's Big Science," said Richard Farnsworth, manager of the Lab's Science and Technology Education Program (STEP).

All lectures are free and will begin at 9:30 a.m. and end at 11:30 a.m. Seating is on a first come,

first served basis. The talks are intended for junior high, high school, and college students. The topics are selected from cutting edge science and technology research in a variety of disciplines.

The series is sponsored by STEP in partnership with Merced College, Merced Union High School District, Los Banos Unified School District, Delhi Unified School District, Merced County Office of Education, and UC Merced.

For a complete list of lectures, topics, and directions to each lecture location, go to the Web at <http://www.mccd.edu/mcti/sos/2005/default2005.htm>.





NEWS YOU CAN USE

Exploring nuclear reactor research opportunities

David Slaughter will present “Research Opportunities and Challenges at the UCD McClellan Nuclear Radiation Center (MNRC) and Other University Nuclear Reactor Programs,” at 10:30 a.m. Friday, April 29 in Bldg. 170, room 1091. Slaughter is the McClellan Nuclear Radiation Center’s director and reactor administrator.

Slaughter will discuss the academic mission of his UC Davis research reactor tools. That mission is to generate as many graduates as possible; publish the results of research in a timely manner; and locate new sources of revenue through research contracts, all mainly through masters and doctoral candidates.

He will tie this discussion in with the current status and the future challenges that face the University Reactor Community. He has begun implementing his vision of a strategic plan for developing MNRC into a national

educational asset.

Slaughter will also provide detailed information on the unique world class research facility that he leads, such as small and very large scale neutron imaging, isotope production and identification, nuclear forensics, survivability and vulnerability, bacteriologic and biologic studies, computerized tomography, seed mutagenesis, neutron activation analysis, fission track analysis, neutron induced auto-radiography, simulation codes, reactor operations, and safety basis analyses training.

Attendees will be briefed on his facility’s capabilities and its place as the newest University Research Reactor (URR) in the United States. URRs encompass a wide variety of disciplines: energy, medical, radiopharmaceuticals, physical sciences, engineering, and material sciences.

Large company corporations that have historically maintained well-funded and fruitful R&D components are now downsizing in order to better cope with competition. As an alternative to such on-site research facilities, many corporations are refreshing their links with universities

that have reactor programs to help maintain an aggressive stance in technology development.

Prior to taking his current position last year, Slaughter held a similar position at the University of Utah reactor in Salt Lake City, Utah. He has been a staunch proponent for the use of test and research reactors for collaborations and individual research for many years. In his year at the MNRC, he has begun changing the concentration of that facility from one that mainly performed commercial neutron radiography to an education / research facility of merit.



Technical Meeting Calendar

Friday
22

INSTITUTE FOR GEOPHYSICS & PLANETARY PHYSICS

“Polarimetry, Circumstellar Disks, and Clusters in the Magellanic Clouds,” by Karen Bjorkman, University of Toledo. Noon, Bldg. 319, room 205. Property protection area. Foreign national temporary building access procedures apply. Contact: Bob Becker, 3-0664.

BIOSCIENCES DIRECTORATE

“Microbial Iron Oxidation at Neutral pH: Bbiofilms and Biomineralization,” by Clara Chan, UC Berkeley. 10:30 a.m., Bldg. 361 auditorium, Darwin Room. Refreshments available at 10:15 a.m. Foreign nationals may attend if the appropriate security plan is on file, which includes Bldg. 361. For a complete schedule of seminar speakers, titles, abstracts and supporting information, go to <http://bbprpseminars.llnl.gov>. Contact: Alice Yamada, 2-4723.

Monday
25

CHEMICAL BIOLOGY AND NUCLEAR SCIENCE/BIOSECURITY & NANOSCIENCES LABORATORY

“Turning Numbers into Drugs and Putting the Structure Back into QSAR,” by Matthew Meyer, Department of Natural Sciences, UC Merced. 2 p.m., Bldg. 151, room 1209, Stevenson Room. Foreign nationals may attend if approved plan is on file, which includes Bldg. 151. Contact: Kathy Ricard, 3-8024, or Ted Tarasow, 2-7241.

Tuesday
26

RADIATION DETECTION CENTER

“Safeguards and Cooperative Monitoring of Reactors using Antineutrino Detectors,” by Adam Bernstein, Advanced Detector Group. 11 a.m., Bldg. 151, room 1209, Stevenson Conference Room. Property protection area. Foreign national temporary building access procedures apply. Contact: Ron Wurts., 3-8504, or Christie Shannon, 3-6683.

G. T. SEABORG INSTITUTE

“Using the Automated Liquid-Liquid Extraction System SISAK to Study the Chemistry of the Transactinide,” by Jon Petter Omtvedt, University of Oslo, Norway. 10:30 a.m., Bldg. 151, room 1209, Stevenson Room. Property protection area. Foreign national temporary building access procedures apply. Contact: Annie Kersting, 3-3338, or Bonnie McGurn, 3-2764.

Friday
29

INSTITUTE FOR GEOPHYSICS & PLANETARY PHYSICS

“The Impact of Massive Stars on the Evolution of Star Forming Galaxies,” by Eric Wilcots, University of Wisconsin-Madison. Noon, Bldg. 319, room 205. Property protection area. Foreign national temporary building access procedures apply. Contact: Wil van Breugel, 2-7195, or Lisa Lopez, 3-0250.

CENTER FOR APPLIED SCIENTIFIC COMPUTING (CASC) / INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH (ISCR)

“Visualization of Complex Heap-Based Data Structures,” by Andreas Saebjornsen, University of Oslo, Norway 10 a.m., Bldg. 451, room 1025, White Room. For more information, go to <http://www.llnl.gov/casc/calendar.shtml>. Property protection area. Foreign national temporary building access procedures apply. Contact: Dan Quinlan (CASC), 3-2668, or Erica Dannenberg, 3-2167.

May
2

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

“Multiphysics Couplings of Subsurface and Surface Flows,” by Ivan Yotov, University of Pittsburgh. 10 a.m., Bldg. 451, room 1025, White Room. For more information, go to <http://www.llnl.gov/casc/calendar.shtml>. Property protection area. Foreign national temporary building access procedures apply. Contact: Carol Woodward (CASC) 4-6013, or Erica Dannenberg, 3-2167.

May
4

PHYSICS AND ADVANCED TECHNOLOGIES/ N DIVISION

“Update on Detection of Well-Shielded Special Nuclear Material in Cargo Containers,” by Dennis Slaughter. 1:30 p.m., Bldg. 211, room 227. Property protection area. Foreign national temporary building access procedures apply. Contact: Dennis Slaughter 2-6425, or Pat Smith, 2-8210.

May
5

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

“Keeping the Columbia Flowing: Managing the Data from an Environmental Observation and Forecasting System,” by David Maier, Portland State University. 10 a.m., Bldg. 451, room 1025, White Room. Property protection area. Foreign national temporary building access procedures apply. Contact: Karen Karavanic (CASC/ISCR), 3-4480, or Erica Dannenberg, 3-2167.

May
6

INSTITUTE FOR GEOPHYSICS AND PLANETARY PHYSICS

“Nearby Galaxies as Revealed by the Spitzer Space Telescope,” by Robert Kennicutt, Steward Observatory, University of Arizona. Noon, Bldg. 319, room 205. Property protection area. Foreign national temporary building access procedures apply. Contact: Wil van Breugel, 2-7195, or Lisa A. Lopez, 3-0250.

The deadline for the next Technical Meeting Calendar is noon, Wednesday.

Please submit your meetings via the new Technical Meeting Calendar form on the Web, located at <http://www-rl.llnl.gov/tmc/index.html> For information on electronic mail or the newsgroup llnl.meeting, contact the registrar at registrar@llnl.gov.

Cafes now equipped with automated defibrillators

The Lab's West and Central cafes are now equipped with an "automated external defibrillator," an easy-to-use device that can administer a potentially life-saving electric shock to the heart of a person suffering cardiac arrest.

An automated external defibrillator, or "AED," is a laptop-sized device that automatically analyzes the heart rhythm of a person incapacitated by cardiac arrest and tells the operator to deliver an electric shock to the heart when appropriate. The AED's automated system instructs users with simple audio commands.

Cardiac arrest is the leading cause of sudden death in the United States and accounts for 75 percent of workplace deaths, according to Dr. Steve Burastero of the Health Services Department.

Immediate use of an AED by a first responder improves survival from "ventricular fibrillation," which is the most common rhythm of a stopped heart, Dr. Burastero said. "AEDs represent a major technological advance in medical treatment and are now commonly found in public places such as hotels, airports, restaurants and sporting venues."

The devices were installed by the Business Services Department's Food Services Group.

Michelle Quick, leader of the Food Services



JACQUELINE MCBRIDE/NEWSLINE

Canteen Corp. employees Terre Martin, left, and Kellie Alcon test one of the new "automated external defibrillators" now available in the West and Central cafes.

Group, said Health Services conducted briefings and training to members of her group and Eurest Dining staff. Selected staff completed a four-hour Hazards Control training class in CPR with an AED. "Installing the AEDs is something simple we can do that potentially has a life-saving benefit," Quick said.

Gary Linney, Fire Department Battalion Chief, assisted in identifying the best locations in the cafes for the devices once training was completed.

An AED is best used in complement with traditional CPR. Employees or groups interested in training may contact Cindy Silveira of the Hazards Control Safety Program at 2-0587.

AED procurement process

To get your organization, group, or building set up with an Automated External Defibrillator (AED), the following process must be followed:

- An order must be sent to Carol Turner via email at turner54@llnl.gov for approval (see attached order form). She will approve it and email it back to you for ordering by your TRR/Resource Manager (the cost of the AED LifePak is \$2195, and an extra battery is \$231).

- While the unit is on order you will need to schedule a briefing with your ES&H Team Clinician (Steve Burastero 4-4506, Bill Pereira 2-0382, Julita Luty 4-4517) from Health Services, to come and talk to your entire group for a quick orientation (20-30 minutes).

- Training then needs to be completed through Hazards Control. This can be scheduled through Deana Root at root6@llnl.gov, (2-5158). It is recommended that four to six people are selected in your group. The course is HS1626 -CPR with AED (Automated External Defibrillator).

- Once the briefing and training have been completed, call Fire Chief Gary Linney to help you identify the best location for the device.

- After all of the above has been completed, Health Services will notify you when your unit arrives.

- An ES&H Manual Document is in process to outline AED maintenance requirements.

If you have any questions before, during or after this process, you can call Kena Anderson, Clinical Operations Administrator, at 4-9854, or Carol Turner, Clinical Operations Manager, at 4-4516.

In tune with Earth Day



Earth Expo 2005, held near the former pool area Wednesday, highlighted Lab and community environmental efforts.

Photos clockwise from top left: Aaron Wegner of Computation plays during swing band concert. Jeanine Sidran of the Lindsay Wildlife Center shows a gopher snake to Wen-Hsiung Kao of DOE Oakland. Lab employee Dave Fuess demonstrates a Segway two-wheeler. Bruce Campbell and Jenny Nivens display the new We recycle Office Waste paper, or WOW, recycling bins.



Photos by
Jacqueline McBride
Newsline



CLASSIFIED ADS

See complete classified ad listings at
<https://www-ais.llnl.gov/newsline/ads/>

AUTOMOBILES

1996 - Saab 900 4 Dr SE Turbo Hatchback. Loaded - Blk,Lthr,CD&changer,Sunroof,pwr options,ski rack,new exhaust,clean condition,102K miles \$4,600 obo 925-249-1640

1990 - Acura, Legend V6 Ls, A/T, Leather, Power Seats, Allow Wheels, New Tires, New Battery, 135k Miles, Silver 3300.00 Or Obo 925-784-6207

1984 - Chevy Blazer new motor,new transmisson,new torque converter,new rebuilt carb, cd player and wired for subs and speakers. Asking \$3500 obo. 925-447-1450

1995 - Saturn SW2 wagon, 4 cyl. 1.9L DOHC, AT, AC, PS, PB, pwr windows & locks, dual airbags, 157k mi, orig owner. \$2000. 209-814-5241

2003 - Ford Focus ZX3, 5-Pass. Hatchback, Auto, Tilt, Cruise, Air, PS, PB, Fog lights, CD/MP3, Sunroof, Warranty, 15K Miles, Perfect Cond., \$9,990 obo, 925-443-3970

1997 - Range Rover, Loaded, Good condition, 70,500 miles, \$12,500 925-449-7782

1998 - Ford Taurus 4 Dr Very Nice Riding Car With Mew Tires... Needs Engine Or Transmission Work? 173,000 Miles Mechanics Special 1500 Obo... 209-543-9669

1990 - TOYOTA CELICA (90), exc. cond, service record, 4AFE eng. manual transmission. 131,000 miles, BO 925-634-2307

1998 - TOYOTA 4RUNNER 4-DR LIMITED 4WD V6, service records available, 84K miles, towing pkg., loaded. Excellent condition, one owner. \$14,888 obo 925-447-1797

AUTOMOBILE ACCESSORIES

Set of 4 (5-lug) mounted 195/70-R14 white wheels with >80% tread left tires. \$25/ea. OR \$90/set. BO. 209-832-3931

4-Wheels off 2002 Ford F150- \$200 obo. integra motor&tranny low milage new clutch full wiring harness \$500 obo. Cr Cadillac rims \$100obo 925-449-1340

Set of 4 Firestone tires, 285x75x16, destination M&S, good tread life. \$150/set 925-765-4404

camper shell for ford F150 ext cab short bed insulated fiberglass tinted wnds rear light tie downs grt shape 500.00 209-531-1330

Tires and wheels from 97 Honda Prelude. Low milage on tires <2K. \$200 OBO. 925-447-3092

4ea Wheels and tires, 8 lug Dodge truck. Beauty rings and caps included. Tires are Michelin 265/75/16 mounted, but are near wear bars. \$150.00 925-443-7752

VW NEW BEETLE roof rack base and cargo holder, great shape, list over \$300, selling for \$150 OBO. 925-424-4384 925-455-4666

BICYCLES

Trunk mounted bike carrier; holds 2 bikes. \$20. 925-443-2826

Please return womens bike bor-

rowed ~ 2 weeks ago: black, 3-speed hub, from green area at bldg. 111 gate north of bldg. 123. Thanks. 510-548-0704

2001 Quintana Roo kilo, 57cm like new with spinergy rev X wheels, ultegra, fsa, crank, Worth over \$2500 will sell for \$1200 209-551-5514

BOATS

1995 ChrisCraft open bow ski boat, V8, EFI, CD, Tandem trailer, Tower, Bimini top, Lots of toys, \$12,000. 510-538-7444

2002 Sanger V230, Blk scorpion, wakeboard tower, bimini top, like new condition (garaged) Less than 55 hours.\$36,000 obo 209-914-5698 or 209-914-2174

1977 Islander 28 Sailboat. Volvo diesel engine, GPS plotter, sterio with indoor-outdoor speakers. Extras, including dingy. Asking \$18,000/obo 925-373-6450

2002 Stingray 220SX - 22 feet, Portapotti, sink, stove, white w/ red accent 6.2liter MPI 320hp, Bravo3, only 39hrs! Clean and fast. \$26,500 925-294-5939

1988 Cajun BASS/SKI Boat 17ft 4.3 mercruiser I/O remote electric trolling motor, 2 batts.,2 live fish wells,new uphostery,etc. \$4,800 OBO 209-234-3854

ELECTRONIC EQUIPMENT

Brand new, palm size videocamera/digital camera/MP3 player. No tapes required, up to 2 hour video on 512MB SD card, \$799 list, sacrifice for \$289 415-543-3643

GameCube, 6 popular E/Teen games, memory card, and controllers for \$160 contact Jonathon 209-836-2737

One year old Sony 36 inch flat screen TV. Beautiful picture. Used only half that time. Too big for my new home. 209-814-8189

HP COLOR printer, like new, hardly used.A good price. 30.00 510-537-7222

Kodak instamatic M105 movie projector, \$50 OBO. 925-706-2088

20in. Samsung color TV w/ remote. Works fine. \$25. 925-456-3462

Mac Mini. 1.25ghz/512mb/40gb/combo drive. w/iLife 05. \$440. 925-273-0823

Injet Printers HP600C, Epson C60 - \$30 ea, Thermal Fax Brothers 180 - \$20. All excellent condition. 650-952-6186

GIVEAWAY

Free! Spa cover and two spa pumps in good condition. They go with spa that needs work. Must take all. 925-447-4455

Televideo 910 dumb terminal (early 80s era) with manual, cable, and modem. Working condition. 925-989-5415

HOUSEHOLD

Mitsubishi 35 inch TV console with walnut cabinet, picture-in-picture, cable-ready tuner, top-of-the-line unit, fantastic picture. \$325 415-543-3643

Remodeling Kitchen. Giveaway cabinets for shed or garage. Selling used but good appliances for best offer. 209-833-1201

Kenmore Upright Freezer Like new - great condition 64î H X 34î W Asking \$250.00 925-684-9897

Oversized Love Seat and Chair. Off white with embroidered design. Excellent condition, minimal use. Must see. \$200. Pictures available 925-964-0534

Hot water solar panels. ~4ft x ~8ft, 2 each, removed from the roof. Make an offer. 925-989-2009

Double bed w/mattress & box spring, matching headboard, night stand, 3-drawer dresser w/mirror, desk w/bookshelf & chair \$550. 209-823-8089

Rug for entryway 5 ft. 5 in. by 7 ft.7 in. Beige w/ brown and cranberry floral design. Sturdy pile. Like new. Picture available. \$100 OBO. 209-836-3041

Little Tykes toy chest, \$10. Flannel sheet sets, twin size, one Toy Story, one Winnie the Pooh, like new. \$10. per set 925-706-2088

Oak bunk bed set with mattresses. \$200 OBO. Oak TV stand, \$50 OBO. 925-447-3092

Anderson 45 degree bay window with wooden frame - 7ft wide by 4ft high *NEW* paid \$1500 asking \$1000 - U-haul. 925-484-1705

Solid oak roll top desk w/locking top. Dark wood, paid \$1200 sell for \$400 firm. Excellent condition 925-515-8339

25cu fridge and King mattress set both in great condition, BO. 209-983-0190

6 piece cherry wood Queen Ann bedroom set, rose wood dining set and cabinet , family room furniture (golf theme). best offers on any items. evenings 925-820-0679

Lovely, small oak china cabinet. Beveled glass doors on lighted upper pc., 2 drawers and storage below. \$350. Call after 5:00pm. 209-836-1455

Maytag Atlantis Washer, Oversize Capacity Plus, Quiet Plus, 5 speed, stainless tub, white, 2 years old, works great, paid \$450, sell \$150, 925-449-2667

MISCELLANEOUS

Rascal Scooter Powerchair, Electric Mobility, excellent condition, ramp and all accesories included, bought for 5K, will sell for \$1500.00 209-833-0337

Kenmore Chest Freezer 42î L X 22î Deep X 3î High Excellent Condition Asking \$175.00 925-684-9897

A's Tickets for Blanket Give Away night Tues 04/26 vs White Sox, Field Level, 5 aisle seats behind home plate Section 119, Rows 33 & 34 \$24/seat 925-449-5481

(2) 10 inch pioneer subs in boxes and 2 6X9 pioneer speaker in boxes paid over \$300 sell for \$150 obo. 209-324-5324

HUGE,HUGE,HUGE, 50 family yard sale! Killigrew Drive area (Vella Estates), Salida. Sat May 7th 209-543-0572

Windows, double pane, glass inserts, approx 27.5 by 57 inches, have two. Work fine \$30. each. (approx \$150 each new). 925-447-8415

Snow tire cables for small car. Only used once. \$40.00/OBO 925-447-4161

Mothers day gift sets. Prices from \$26.50 to \$200. 209-918-4573

Single bed like new,wicker head board,\$200.00 925-455-5070

Nice Redwood picnic table for 6-8 people. good condition. \$50.00, misc. canning jars if interested, can bring jars to work, 10.00 510-582-2938

Miter hand saw \$20. Pop-up trundle, not entire day bed \$10. Small computer desk \$40. Computer cart \$30. 925-706-2088

Playstation 2 game-Dragonball Z Sagas, Brand new, cost \$50 sell for \$40 925-292-0348

Ryobi 310BVR gas leaf blower,\$20; B&D HT500 22in elec.hege trimmer,\$10; both run great. 209-239-8984

Automatic pool sweep for above ground pool. Zodiac barracuda. New in box, Paid \$350, sell for \$100 925-516-8339

Luggage - large size, 2 matching pieces bought at Macys. Floral tan design, excellent shape \$20 for both 925-443-6603

Makita 1-1/4 HP plunge router, model 3621. Never used. \$100. 925-456-3462

LLNL employee seeking loaner or rental automatic vehicle for use during May and June. Having shoulder surgery and cant drive my own vehicle. 925-960-0263

GOURDS in Livermore? Various sizes & shapes, hardshell gourds for decorating. 925-455-1776

MOTORCYCLES

1970 - Honda Trail 70 Blue, fold down handle bars lights,grt condition runs good lot of fun grt for camping orig owner, 800.00 209-531-1330

1988 - Harley-Davidson Heritage Softail, 38k mi., Crane cam, S&S carb, windshield, rack and saddle bags, factory custom paint, \$10,000 925-960-0699

1996 - Honda Shadow Ace Motorcycle, 1100cc Corbin Build-out, must see, 4500K 209-839-0068

1985 - Suzuki 185 Quad ATV, very low miles, very good condition. \$800 B.O. 925-443-4336

1984 - Harley-Davidson FXR custom. Laced wheels lots of chrome & extras. \$9,500.00 (LOOK price reduced!!) Or reasonable offer. 209-351-0631

Joe Rocket Meteor 3.0 jacket (red/black) size medium good condition \$40. Leather jacket (size 38) & pants (30-32 waist) both for \$100. 209-832-1038

MUSIC INSTRUMENTS

Gulbransen Premier dual-manual organ, built-in Leslie, exc. cond. fully functional, recently tuned. \$1200 firm. Will help move locally. 925-

447-8837

Paul Reed Smith Guitar 1995 Classic CE-3 RB transparent royal blue with quilt top finish. Still has hang tags! minimal wear. \$1100.00 209-351-0631

PETS & SUPPLIES

Free to good home! Two very gentle indoor cats. 2 yr. old sisters, spayed. 1 black, 1 black & white. Great pets for children!! Wish I could keep. 925-449-2229

Jack Russell Terriers, 3 weeks old, 4-SALE, 3 left, \$500.00 each,CKC Registered, will have first shots. Call for a viewing or pictures. 925-516-9606

Show bunnies, prices vary. Parakeet cage \$10. 925-706-2088

Bearded Dragon, 1yr old, very friendly, hand fed. Terrarium, heat rock, lights, take all for a measly \$50.00. 209-772-1849

German shorthair pointer pups for sale field champion blood line snap-e-tom breeding. litter due may 15 call 4 details. 925-447-4479

RECREATION EQUIPMENT

Boat 1995 23 ft Bayliner Trophy 150 HP Merc engine. Excellent condition. Loaded with electronics too much to list. Call for details. 925-447-6728

Ladies golf clubs, Wilson Precision graphlite; full set irons, woods, putter and bag - \$125. Sparring gear, two sets, \$20 per set, one for child. 925-706-2088

1972 Jeep CJ-5 lifted, engine solid, smog-exempt, needs body work. \$1950/OBO. 209-456-6947

1994 Jaco motorhome, designer series, 1995 C class 28 foot, 31K miles, 35K dollars sleeps five. 925-447-5015

SADDLE: CROSBY Equilibrium, close-contact saddle with all fittings, exc conditions, BO 925-634-2307

Paintball Marker - Mongoose reincarnation, black. Accessories - 20 oz CO2 tank, electric rhno hopper, 16in barrel. All for \$180 OBO 925-443-3451

Spa(w/steps) for sale in new condition. Not even a year old bought from Dublin Pool & Spa and well taken care of. Paid \$8000 will sell for \$4500. 925-366-9981

Taylor Made Driver & 3-Wood Super Steel, Graphite, Regular Shaft, Excellent Cond. \$40ea. 925-443-6603

Skiis Elan 167cm, Fisher 157cm with bindings - \$30 ea pair. 650-952-6186

RIDESHARING

Express your commute, call 2-RIDE for more information or visit <http://www-r.llnl.gov/tsmp>.

Oakland/Montclair - has openings. Departs Montclair 7:30 a.m.; departs LLNL 5:00 p.m. For more info call Ron, 510-530-1289, ext. 2-9831

Lafayette - LaMOrinda Vanpool (also WALNUT CREEK stop at Rudgear commuter lot): reclining seats, read-

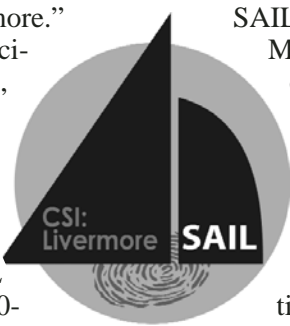
Science Adventure Institute Livermore sets SAIL this summer

The Laboratory and Edward Teller Education Center (ETEC) are again hosting “Science Adventure Institute Livermore” (SAIL), an exciting academic enrichment program in June and July for students entering the sixth or seventh grade in the 2005-2006 school year.

This year’s program will be conducted in partnership with the Livermore Valley Joint Unified School District (LVJUSD). Classes will be held at East Avenue Middle School, 3951 East Ave., Livermore.

This year’s theme is: “CSI: Livermore.” The curriculum will focus on forensic science and crime scene investigation, beginning with a mock crime scene. Students will gather and analyze data and ultimately present their findings during a mock trial where they are the expert witnesses, judge and jury.

Two redundant three-week SAIL sessions will be conducted from June 20-July 7 (no class July 4) and July 11-28. Each



SAIL session runs from 8 a.m. to 12:30 p.m., Monday through Thursday. There are no classes on Fridays.

Class size is limited to 20 students per session. Students may register for one session only. Livermore residency is not a requirement to enroll. To pre-register your child, go to <http://education.llnl.gov/SAIL/>. For more information, call Nadine Horner, 3-9051.

AURORA

Continued from page 1

their recommended initiatives and together set overall priorities by mid to late summer. Once the teams have identified priorities, senior management will review these, make a final selection, and appoint “owners.” The initiative owners will assemble an implementation team to identify needed resources, develop detailed plans and timetables and establish metrics for progress.

As a part of the process, each team must

also decide where the Lab needs to be in 2007 and 2012 — mileposts to ensure the Lab is on track to meet its 2025 goals.

Aurora was borne from intensive discussion about the Laboratory’s future direction at the Senior Management Council’s February offsite. Following that meeting a new 2025 vision was unveiled: LLNL must continue to evolve into “a multidisciplinary science and technology lab dedicated to national security in the global context.”

In addition, senior managers also agreed that “the nation’s national security needs will be broadened to include not only what we are

addressing today, but include more emphasis on biodefense, energy, security, environmental security and asymmetric warfare — terrorism.”

How the Lab will prepare to address these challenges is now the task of each of the five planning teams.

“These are just predictions and there’s no certainty that these will be the only challenges the Lab will face,” Murray said. “Ultimately, the Lab must remain agile, adaptable and efficient so that it can respond no matter what the future brings.”

Newsline, *NewsOnLine* and the Aurora Website will provide regular updates on project progress.

ELECTRICAL

Continued from page 1

The two serious “Type A” incidents referred to above were the first since 1997, according to the DOE report.

Contractor line management needs to do more to “demonstrate the adequacy of expectations and accountability for ensuring improved electrical safety performance,” Bodman said. “We must do better.”

“I want these managers to redouble their efforts to improve electrical safety performance and share their lessons learned,” he said.

Bill Bookless, the Laboratory’s associate director for Safety and Environmental Protection, applauds the energy secretary’s effort to raise awareness of electrical safety across the complex. “The Laboratory has a program in place defining a strict set of rules governing all electrical work — an effort that has drawn the interest of other DOE contractors,” Bookless said. “We support any effort to raise awareness and to share lessons learned that can enhance our program.”

More than two years ago, the Laboratory put in

place strict rules and guidelines for electrical work and a rigorous inspection system under the “Authority Having Jurisdiction” program, or AHJ. This program has served as a model for other DOE contractors including the Stanford Linear Accelerator Center (SLAC), Hanford, the Nevada Test Site and Pantex, according to Keith Gershon, a Hazards Control Environmental Safety and Health deputy team leader instrumental in implementing the Lab’s electrical safety inspection regimen.

The electrical equipment overseen by the AHJ program includes everything from common equipment, such as coffee makers, extension cords, computers, and power tools, to R&D and industrial equipment, such as power supplies, pumping systems, lasers, X-ray generators, and capacitor banks.

Electrical equipment tested and certified by an independent agency, officially designated a Nationally Recognized Testing Laboratory (NRTL), is considered to be in compliance and is automatically approved for use at LLNL — it does not require AHJ inspection and approval.

Uncertified or custom-built electrical equipment and NRTL-certified electrical equipment that has been modified require inspection by an AHJ-

trained field representative, who determines its compliance or noncompliance. Equipment must be approved by the AHJ before it can be connected to the LLNL electrical system.

The main causes of electrical safety occurrences among DOE contractors cited in the energy secretary’s memo include: inadequate work planning; work on energized equipment without authorization or proper personal protective equipment; failure to perform zero-energy checks; inadequate training; failure to exercise stop-work authority; poor configuration management; and inadequate supervision and oversight.

In 2004, there were 149 electrical occurrences, including 25 involving electrical shocks, according to the DOE report quoted by Bodman. In addition, “the largest portion of near-misses are electrical.”

“We were one of the first to have a comprehensive system for inspecting electrical equipment,” Gershon said. “We’re proud of our inspection program, but we’re always in a continuous improvement mode.”

Starting in the next few weeks, *Newsline* will run a series of articles dedicated to raising awareness of electrical safety issues.

ing lights, 7:45-4:45, \$105/mo (pretax reduction available) 925-943-6701, ext. 2-3005

Clayton/Concord/WC/PH - Car pool looking for 2 rider/drivers; leave Rudgear Road P&R @ 6:15; Start wk @ 7:00, Return from Lab @ 4:00;return to P&R @ 4:40. 925-672-6677, ext. 3-2153

\Valley Springs - Carpool/driveshare working 5-8s. I leave Valley Springs-Warren Rd at 5:30am and leave LLNL at 3:30pm. 209-887-2353, ext. 2-9899

San Jose/Fremont - 14 passenger van needs riders; Leaves San Jose/ Berryessa 6:40; leaves Fremont/Mission 7:00; arrives LLNL 7:30; leaaves LLNL 4:30. Very reliable. 408-238-1909, ext. 3-3057

SERVICES

CONCRETE-foundations, custom,

stamped, colored, sealing & more. Over 20 years experience. Free estimates. Lic #787092-B. 408-806-9816

WANTED -- repairman/handyman to replace fence at my home. Also plumber to replace faucets in bathrooms. Lic preferred but not absolutely necessary. 925-580-9694

CARPET/LAMINATE/LINOLEUM Flooring contractor with over 20 yrs experience. Licensed/bonded/insured. 925-516-9510

Bills Mobile Notary & Signing Agent, Available 24/7 925-454-9483

QUALITY PAINTING, take advantage of low season discounts. Excellent references, prep work and workmanship. 25 yrs exp. Call before it gets too hot. 510-537-7222

SHARED HOUSING

Livermore. - Older man looking for furnished room to rent close to LLNL

Mondays thru Thursdays. Must be clean house and neighborhood. 925-447-3080

TRUCKS & TRAILERS

1950 - Chevy stepside, split front windshield, with extra bed and other goodies,runs needs water pump, ready for restoration, no body rot. \$1500 obo 925-449-1340

1985 - K5 Blazer,4WD,4 inch lift,198,000 mi.,rebuilt tranny,Power windows,locks.Runs good,looks good.\$2900 o.b.o.Leave message. 209-239-1963

1996 - RANGER XLT, good running work truck. Bedliner, cassette, V6, extra cab, A/C, alarm. Good condition. 5,500.00 OBO 510-537-7222

1952 - GMC P/U. 6cyl, 5 window. Grill and hood are in great shape. Not running, full surface rust. Never modified. Restore or rod. \$500. 209-

825-0326

VACATION RENTALS

Mountain cabin near Arnold. 4 bedr, 2 bath, sleeps 10-12. Lakes, hiking, fishing nearby. Beautiful when snow melts!! 925-245-1114

Soooo cute beach cottage in Santa Cruz. 2 bedr, 2 bath, spa. 4blks from ocean. Near harbor. Summer books quickly, plan ahead! 925-245-1114

Gualala, CA (Mendocino Co) - Stunning whitewater ocean views, 2bd/2ba vacation home w/ deck, bbq & hottub. Walking distance to town w/ shops, resturants & spa. \$511/weekend. 925-606-1845

SOUTH LAKE TAHOE - 3 Bedroom 2 Bath Chalet, comfortably furnished, all amenities,close to all skiing,RESERVE NOW! HURRY FOR SKIING/WINTER FUN!! 209-599-4644

Maui, HI - Kahana Reef oceanfront

1BR/1BA condominium. Beautiful two-island view, oceanside pool, and BBQs. LLNL rates for year-round reservations. 925-449-0761

WANTED

Wanted: Someone to remove a 20-25 ft redwood tree in Brentwood. Call for more details, or to give estimate. 925-200-6227

Accordion wanted in great working order. Black if possible. For my lessons, small accordion band. Will be well cared for. Own professional accordion. 209-576-0217

Looking for a 2+ bdrm house/apt that allows pets. East Bay, near BART for easy commute to SF or the Lab. Must be PETS OK! 415-564-5617

Looking to rent a car for approx. 2 months for very short commute. Must be automatic and reasonably reliable. I am having shoulder surgery. 925-960-0263

DOE awards UC contract to manage Berkeley lab

The Department of Energy (DOE) has awarded a new five-year contract to the University of California to manage and operate its Lawrence Berkeley National Laboratory (LBNL). The award is the result of the first competition of the management and operating (M&O) contract for the laboratory since its inception.

The value of the new five-year contract is an estimated \$2.3 billion. Berkeley Lab's \$469 million annual budget is funded by the department's Office of Science, and other DOE programs, as well as other government agencies and private industry.

"Because of its outstanding work, including 10 Nobel Prizes won by its scientists, Lawrence Berkeley Laboratory has helped ensure U.S. scientific leadership for more than 60 years," Secretary of Energy Samuel W. Bodman said. "This contract award will allow LBNL and its outstanding researchers and staff to seamlessly continue their work as they set new standards of scientific excellence."

UC President Robert Dynes congratulated Lawrence Berkeley National Laboratory Director Steve Chu and the Lab's employees. "The excellent scientific and technological work being done at the laboratory under Steve's leadership is what I believe the Department of Energy recognized in awarding this contract to UC," Dynes said. "I am

very pleased that the Department of Energy has chosen the University of California to continue our proud tradition of managing Lawrence Berkeley National Laboratory. For more than 60 years, since E.O. Lawrence pioneered this kind of collaboration, the university has partnered with the federal government to manage this important scientific and technological enterprise in the national interest.

"Lawrence Berkeley Laboratory is an excellent example of the successful interaction between universities and the federal government in managing a scientific research facility and producing results of national significance. Lawrence Berkeley Laboratory is about breathing life into ideas and bringing researchers together in a rich interdisciplinary environment, to solve the scientific and technological challenges facing our nation and world," Dynes added.

Following a short transition period, the initial contract term will be June 1, 2005 to May 31, 2010. UC has operated the laboratory since 1943 for DOE and its predecessors. The contract award follows the submission of a proposal by UC Regents in response to DOE's Dec. 15, 2004, Request for Proposals (RFP). Marvin E. Gunn, Jr., Manager of the Office of Science's Chicago Office, was the source selection official.

"Our review determined that the proposal by the University of California was responsive to the RFP and that award of the contract was in the best interest of the government," Gunn said. "The new and innovative aspects of this agreement and the opportunity to bring its provisions into alignment with DOE's best M&O contracting practices demonstrate the value that competing the contract brings to managing this laboratory."

This contract award is the first involving a major DOE science laboratory in response to Congressional legislative direction in 2003 to compete five science and defense laboratory M&O contracts that were awarded more than 50 years ago without competition.

LBNL's missions include basic science and technology development and areas of research include the physical sciences, computing sciences, energy sciences and biosciences.

LBNL's unique research facilities, which attract scientists from all over the world, include the Advanced Light Source, Biomedical Isotope Facility, National Energy Research Scientific Computing Center and the National Center for Electron Microscopy. The Molecular Foundry, a national nanoscience research center, is currently under construction and is expected to go into full operation in 2006.

NEBULA

Continued from page 1

ment of the isotope Oxygen 16 (O-16). An isotope is a variation of an element that is heavier or lighter than the standard form of the element because each atom has more or fewer neutrons in its nucleus. The CAIs in this study are enriched with an amount of O-16, 4 percent more than that found on Earth. And, while 4 percent may not sound like much, this O-16 enrichment is an indelible signature of the oldest solar system objects, like CAIs. CAIs and chondrules are tens of millions of years older than more modern objects in the solar system, such as planets, which formed about 4.5 billion years ago.

"By the time chondrules formed, the O-16 content changed to resemble

what we have on Earth today," Hutcheon said.

In the past, the estimated lifetime of the solar nebula ranged anywhere from less than a million years to 10 million years. However, through analysis of the mineral composition and oxygen and magnesium isotope content of CAIs and chondrules, the team was able to refine that time span to roughly 2 million years.

"In the past the age difference between CAIs and chondrules was not well-defined," Hutcheon said. "Refining the lifetime of the solar nebula is quite significant in terms of understanding how our solar system formed."



Researchers analyzed the calcium aluminum-rich inclusion (CAI), larger circular object in center, and chondrule, smaller circular object on left, in a hand specimen of the Allende meteorite.

MICROBES

Continued from page 1

entists from the Joint Genome Institute (JGI) who cut to the chase with a new strategy for comparing diagnostic DNA signatures, telltale signs of particular environments, in the April 22 edition of the journal *Science*.

In the study, information-rich snippets of DNA sequence were teased out of genetic material from diverse terrestrial and aquatic habitats-including Minnesota farm soil and whalebones from a mile underwater. Then, by comparing these unassembled pieces of complex environmental jigsaw puzzles, site-specific motifs came to light — ones that can be used to detect environments under stress as well as signal progress in remediating contaminated environments.

Dubbed Environmental Genomic Tags, or EGTs, these indicators capture a DNA profile of a particular niche and reflect the presence and levels of light, nutrients, pollutants, and other features. This metagenomics approach holds promise for accelerating advances in environmental sciences akin to the contributions DNA sequencing has already made to biomedical sciences.

In the early 1990s, incomplete fragments of human genes called Expressed Sequence Tags (ESTs) were used to distinguish unique features of human tis-

sues — allowing researchers to home in on important disease genes long before the completion of the entire human genome.

"With EGTs we don't actually need a complete genome's worth of data to understand the functions required of the organisms living in a particular setting," said JGI Director Eddy Rubin, who led the research team. "Rather, the genes present and their abundances in the EGT data reflect the demands of the setting and, accordingly, can tell us about what's happening in an environment without knowing the identities of the microbes living there."

For example, genes involved in breaking down plant material are over-represented in soil and absent in the sea water, while in sea water, genes involved in the passage of sodium, a major chemical component of salt water, are particularly abundant. As light is a major energy source for microbes living in surface water there was an abundance of genes involved in photosynthesis in those samples.

Rubin's Berkeley lab Postdoctoral fellow Susannah Green Tringe from Rubin's Lab at Lawrence Berkeley National Laboratory was first author on the *Science* paper, which also included JGI researchers Art Kobayashi, Asaf Salamov, Chris Detter, and Phil Hugenholtz, as well as collaborators from Diversa Corporation and the European Molecular Biology Laboratory, Heidelberg, Germany.



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